I claim:

1. A tube segment for treating a disease process in the vicinity of a luminal structure, said tube segment including radioactive material for producing radiation for treating a disease process, said tube segment being adapted to be carried by a balloon catheter having a catheter shaft and balloon for insertion in the luminal structure, and being made of expandable and collapsible material, whereby its shape may be determined by the shape of the balloon.

2. The tube segment according to claim 1, wherein the radioactive material is in the form of a coating.

3. The tube segment according to claim 1, wherein the tube segment comprises a mixture of radioactive material and non-radioactive material.

4. The tube segment according to claim 1, wherein the tube segment comprises non-radioactive material into which is adsorbed radioactive material.

5. The tube segment according to claim 1, wherein the tube segment has adhesive material on its inner surface, for adhesing the tube segment to the balloon or catheter shaft.

6. The tube segment according to claim 1, wherein the radioactive material is present in a predetermined dosage per surface area of the tube segment when the tube segment is in an unexpanded state, but wherein the dosage changes as the tube segment is inflated.

7. The tube segment according to claim 1, wherein the tube segment is expandable in a range of sizes.

8. An apparatus for treating a disease process in the vicinity of a luminal structure, comprising:

a balloon catheter having a shaft and an inflatable

balloon; and

a tube segment adapted to be carried by and cover said balloon, said tube segment including radioactive material, and being made of expandable and callapsible material, whereby its shape may be determined by the shape of the balloon.

9. The apparatus according to claim 8, wherein the tube segment comprises radioactive material in the form of a coating.

10. The apparatus according to claim 8, wherein the tube segment comprises a mixture of radioactive material and non-radioactive material.

11. The apparatus according to claim 8, wherein the tube segment comprises non-radioactive material into which is absorbed radioactive material.

12. The apparatus according to claim 8, wherein the tube segment is adhesively attached to the balloon or catheter shaft.

13. The apparatus according to claim 8, wherein the tube segment is attached to the balloon or catheter shaft by heat sealing.

14. An apparatus for treating a disease process in the vicinity of a luminal structure, comprising:

a balloon catheter having a shaft and an inflatable balloon; and

a tube segment mounted on the shaft inside of said balloon, said tube segment including radioactive material, and being made of expandable and collapsible material, whereby its shape may be determined by the shape of the balloon.

15. The apparatus according to claim 14, wherein the tube segment comprises radioactive material in the form of a coating.

16. The apparatus according to claim 14, wherein the tube segment comprises a mixture of radioactive material and non-radioactive material.

17. The apparatus according to claim 14, wherein the tube segment comprises non-radioactive material into which is absorbed radioactive material.

18. The apparatus of claim 14, wherein the tubular segment is sheathed in foil.

19. The apparatus of claim 14, wherein the tubular segment comprises a coil.

20. The apparatus of claim 14, wherein the tubular segment is impregnated with a radioisotope.

21. The apparatus of claim 14, wherein the tubular segment is coated with a radioisotope.

22. A method for treating a disease process in the vicinity of a luminal structure comprising:

inserting a balloon catheter into a luminal structure, said balloon catheter having an inflatable balloon and a tube segment of expandable and collapsible material and which includes radioactive material;

inflating the balloon with fluid to expand the tube segment and move the tube segment closer to the interior of the luminal structure;

deflating the balloon and collapsing the tube segment; and

removing the balloon catheter including the tube segment after a desired radiation dose has been achieved.

23. The method, according to claim 22, wherein the step of inflating comprises inflating the balloon with gaseous media.

24. The method according to claim 23, wherein the gaseous media is selected from the group comprising Co_2 and Argon.

25. A tube segment for treating a disease process in the vicinity of a luminal structure, said tube segment including radioactive material for producing radiation for treating a disease process, said tube segment producing a radiation dose which varies along at least one dimension of the tube.

26. The tube segment according to claim 25, wherein the dimension is axial.

27. The tube segment according to claim 25, wherein the dimension is longitudinal.

28. An apparatus for treating a disease process in the vicinity of a luminal structure, comprising:

a balloon catheter having a shaft and an inflatable balloon; and

a tube segment adapted to be carried by and cover said balloon, said tube segment including radioactive material for producing radiation for treating a disease process, said tube segment producing a radiation dose which varies along at least one dimension of the tube.

29. The tube segment according to claim 28, wherein the dimension is axial.

30. The tube segment according to claim 28, wherein the dimension is longitudinal.

31. An apparatus for treating a disease process in the vicinity of a luminal structure, comprising:

a balloon cathether having a shaft and an inflatable balloon, and including radioactive material; and

a tube segment at the distal end of a tube, said tube segment adapted to cover the balloon and to be moved longitudinally relative to the balloon to uncover the balloon to thereby respectively shield and unshield the radioactive material from the luminal structure when deployed.

32. The apparatus according to claim 31 wherein the tube segment comprises radioactive shielding material.